



Serial No. 09/990,852:

Examiner: John Shew

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s):	Michael Wengrovitz	Docket:	134085
Serial No.:	09/990,852	Art Unit:	2664
Filed:	11/21/2001	Examiner:	John Shew
Title:	System and Method for Transmitting Information Via a Call Center SIP Server		

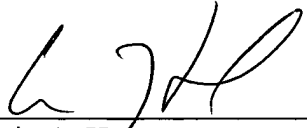
DECLARATION UNDER 37 C.F.R. 1.131

I, Craig A. Hoersten, do declare and say:

1. I reside at 2425 Hopkins Drive, Plano, Texas 75025 and have since May 2000.
2. I am Corporate Counsel for Alcatel USA, authorized to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith.
3. The present invention was described in a Technical Information Sheet (attached as Exhibit A) that was prepared and dated 7/31/2000 and subsequently submitted to the Alcatel Intellectual Property Department.
4. The Invention was filed as a provisional application with the U.S. Patent and Trademark Office on September 6, 2001 and received Serial No. 60/317,746.
5. The Invention was approved for filing of a utility application on or about September 12, 2001.
6. Preparation of the utility application was completed for filing on November 21, 2001.

I further declare that all statements made herein of my own knowledge are true, and that all statements made on information and belief are believed to be true; and further that all these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

Date 1-26-06



Craig A. Hoersten
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FIT (Fiche D'Information Technique)
TECHNICAL INFORMATION SHEET
Alcatel eND Invention Disclosure Form

Title: Novel Usage of Call Center SIP Proxy Servers (CCSPS) for E-Business Applications

Date: 7/31/00

Originating Business Division/Unit: eND

Other Affected Business Divisions: Genesys

Patent Application Questions (very important):

1 What is the prior art?

(Before your invention, what were the best known/existing solutions to solve the technical problem (presently known to the inventor?—Do not go looking for prior solutions if you do not know of any))

SIP Proxy Servers are defined in the open literature. These servers satisfy the SIP standard and route calls to the appropriate destination. Back-to-Back User Agents are also defined in the open literature, and have the ability to route calls. Neither of these engines manipulate the body of the messages to accomplish a specific task.

2 What is the problem(s) with the prior art?

(Why were these known/existing solutions not good enough or why do we need your invention?)
(explain in full detail)

Textual information which accompanies the call can be important to the caller and callee. For example, when a call is rejected, a textual/graphical explanation of why the call was rejected can be important to the caller. Similarly, when a call center agent receives the call, an accompanying textual message including account history, and various collateral caller information can be important to the business transaction which is occurring. Although SIP makes provisions for carrying a text message along with the call setup messages, this information is written by the callers in prior art, rather than by the routing engine. The specific form of the routing engine which provides this new service is referred to as a Call Center SIP Proxy Server (CCSPS) in this application.

3 How exactly does your invention solve the problem(s) with the prior art?

(Please give examples and drawings---Extra pages or specifications should be attached)

(What is the technical problem that was solved? Make clear how this is different from existing solutions.)

(explain in full detail) SEE BELOW

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4 What are the steps from when a packet enters the box to when it leaves the box for your new solution (or when the process or method starts to when the process or method stops)?

1 Novel Usage of Call Center SIP Proxy Server (CCSPS) for E-Business Applications

1.0 Background:

Call centers provide an important communications link between consumers and businesses. In typical applications, a consumer places a telephone call via the standard public telephone network to the main 800 number of the call center, and is then transferred to an appropriate call center agent who services the consumer's requests. The consumer can then get personalized service through voice discussions with the call center agent regarding sales, service, account status, or other issues.

Advanced call centers utilize Computer Telephony Integration (CTI) technology to intelligently route each incoming call to the appropriate agent, and to automatically provide the agent with caller-specific information. The caller-specific information is typically retrieved from the call center database, and is then screen-popped to answering agent's PC. The ability of the call center agent to access, associate and transfer customer-specific database information in conjunction with the voice call is key to providing good customer service and managing customer relations.

As telephony networks evolve from conventional circuit-switched public telephone networks to packet-switched IP networks, the technology in call centers must similarly evolve. Next-generation call centers must support these new forms of communication, and should also offer the potential for providing better customer service by exploiting voice/data convergence. One of the most promising voice-over-IP network protocols is Session Initiation Protocol (SIP). This patent addresses the novel usage of SIP for next-generation call centers and E-business applications.

In a previous patent application, "Advanced Call Routing in SIP Telephony Networks Using Caller-eD Information", the use of a SIP proxy server to perform call routing was discussed. The essential part of the previous patent was that a SIP proxy server, which is used to forward calls, can read not only the header of the SIP INVITE message from caller, which contains information such as From:, To:, etc, but also the body of the SIP message, as depicted in Figure 1a, to perform advanced call routing. Reading and interpreting the body of the SIP message written by a SIP user agent client (caller) provides a direct means for the SIP Proxy Server to deduce the intent of the caller and to thereby accurately route the call.

This patent recognizes that there are additional benefits associated with a SIP Proxy Server *writing* the body of the SIP message, as depicted in Figure 1b. Since the body of the SIP message is typically written by the User Agent Client (caller) or the User Agent Server (callee) in SIP applications, it is believed that the use of a call center SIP Proxy Server to write the SIP message body is novel. The patent describes the associated techniques and benefits associated with SIP Proxy Server message composition for next-generation call centers and e-business applications. In this patent, we refer to a SIP

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Proxy Server which exploits the capability of writing SIP message bodies as a Call Center SIP Proxy Server (CCSPS).

2.0 Description of the Patent:

Consider a SIP-based call center architecture, depicted in Figure 2, where callers (consumers) and callees (call center agents) use SIP telephones. All calls arriving at this call center must be proxied (forwarded) by the CCSPS. SIP callers cannot make contact with call center agents directly - the CCSPS is responsible for forwarding each incoming call to a suitable call center agent.

The CCSPS is a specialized SIP Proxy Server which provides the interface between the call center network and other external networks, such as the Internet. We envision the CCSPS as having certain features and characteristics optimized for next-generation call center operation, and not generally found in other standard SIP Proxy Servers. This patent proposes that the CCSPS uses standardized SIP headers and message body specifications in novel ways, which support and enhance operation of next-generation call centers.

2.1 CCSPS Composition of SIP Message Bodies for Conveying Information to Unauthorized Callers

In the simplest aspect of this invention, the SIP INVITE is received by the CCSPS, which then queries a database and determines that this call should not be forwarded to an agent at all. Both a SIP message header and a SIP message body, constructed and written by the CCSPS, are returned to the SIP caller, as depicted in Figure 3. The database query can be based on caller-id information extracted from the INVITE From: header.

In typical SIP applications, a standard SIP Proxy Server would return only the "SIP Response Message 401 Unauthorized" message. However, in this invention, the CCSPS also writes additional information within the body of the SIP response message, which is then rendered on the calling SIP client. The information written by the CCSPS conveys important information to the caller about why the voice access to a call center agent was denied, possible additional instructions for the caller about how to proceed next, or other information which may be useful to the caller.

To illustrate these operations, we consider an example of a technical support call center, where authorized callers must have pre-purchased telephone support. A SIP caller who has not yet purchased this technical support places a SIP call using a SIP INVITE to the CCSPS. The CCSPS then checks its call center database and determines that this particular caller is not authorized for voice access, and that the voice call should therefore not be forwarded to a technical support expert within the call center. The CCSPS then constructs a SIP message body which politely explains that voice access is currently not available, and that voice technical support can be purchased on-line at some specific website, or with a credit card number given to an agent at some other telephone number, or via SIP URI.

The format of the message body written by the CCSPS can be HTML, a URL, plain-text, text-encrypted with the caller's public PGP key, compressed text, or any of the other standard message body types supported by SIP.

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The message can be a standard message or personalized by the CCSPS from caller-specific-information stored in the database. An example of a personalized message for a caller that has already exceeded the allotted number of calls to the technical support call center might read "Sorry Mr. Smith, you last purchased a 10-call technical support plan on Jan 13, 2001, which now has been fully utilized. In order to purchase additional support, please access the following website".

Composition and personalization of a SIP message body by a CCSPS accessing a call center database is believed to be one novel aspect of this invention.

Careful composition and construction of the SIP response message by the CCSPS is an important method for managing customer relations. Polite written explanations for the denied access to the call center, instructions on how to proceed next, and message personalization are all made possible via this method of CCSPS composition of SIP message bodies.

2.2 CCSPS Composition of SIP Message Bodies for Conveying Information to Authorized Callers

In the next aspect of the invention, consider the case where the caller is authorized to speak with agents in the call center. The SIP INVITE is received by the CCSPS, which then accesses a database to extract information about the caller. Prior to forwarding the call to the agent, the CCSPS returns a SIP 1xx informational response, such as "181 Call is Being Forwarded" message, or a "182 Call is Queued" message, along with a personalized SIP message body. This operation is depicted in Figure 4. The CCSPS might actually delay issuing the INVITE to the call center agent to assure that the caller has had the chance to review the information sent within the 181 or 182 Response message bodies. (1)

The SIP message body composed by the CCSPS could contain advertisements, special sale information, personal account information, information about the expected waiting time for an agent to answer, and other forms of information. This information is received and rendered on the caller's SIP appliance or PC, prior to the forwarding of the call by the CCSPS.

By way of example, consider a SIP consumer call to an airline SIP call center. The SIP INVITE from the caller is received by the airline's CCSPS, which then performs a database lookup based on the caller-id information to extract information about the balance of the caller's airline mileage account. The CCSPS then constructs a SIP "181 Call is Being Forwarded" response message body with personalized airline mileage information, a list of current airline destinations with special fares, a polite request to the caller to have existing airline flight number and departure date/time information ready and on-hand for the agent, and the estimated waiting time before an agent becomes available.

For transfer of personal data by the CCSPS to the caller, such as account balance status and details, the CCSPS might first return a "407 Proxy Authentication Required" response thereby forcing the caller to respond to the challenge according to standard SIP protocol. After the CCSPS determines that the Caller is fully authorized, the personal data can then be conveyed with a "181 Call is Being Forwarded" message or "182 Call Queued message, as depicted in Figure 5. (2)

Personal data sent from the CCSPS to the caller, within the body of a 1xx response can be encrypted using standard SIP encryption techniques. For example, the SIP message body could be personalized and then encrypted using the caller's PGP public key.

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CCSPS-composition of SIP message bodies can yield important benefits for both consumers and businesses. Consumer benefits include accessing relevant personal data, receiving targeted advertisements, and becoming informed about the remaining waiting time in call center queue. Call center benefits include instructing the caller about what additional information might be needed during the voice call in order to reduce the time agent spent in the call, transmitting targeted advertisements to the caller, and customer relationship management.

2.3 Using CCSPS-Composition of SIP Message Bodies for Conveying Information to Call Center Agents

It is well-known that call centers can improve efficiency and customer relationship management by automatically supplying the call center agent with information about the caller. In existing call centers based on public telephone networks, caller ANI information is used to lookup caller-specific information from the call center database. This caller-specific data is then screen-popped to the call center agent. Thus, when the call is answered, relevant data about the customer, such as name, address, contact information, purchase history, etc, is already visible and accessible to the call agent.

Deploying screen-pop technology to call centers using public telephony networks is actually quite complex, requiring numerous interfaces between the telephone switch (PBX), the call routing engine or ACD, the CTI client on the agent PC, and CTI server on the call center data network.

One aspect of the present invention is that through CCSPS-composition of the SIP message body, a simple and efficient means for conveying caller-specific information to the call center agent can be achieved. Figure 6 depicts this aspect of the invention. 

In this scenario, an incoming INVITE arrives (1) from a SIP caller. The CCSPS accesses a database (2), and sends a 1xx message (3) with a CCSPS-composed message body, as previously described in this patent. Next, the CCSPS determines the appropriate agent to which the SIP call should be routed and issues an INVITE (4). The body of the INVITE to the call center agent is a multipart MIME message comprised of the original caller SDP, containing the caller's Voice-over-IP codec information, IP address, RTP port, etc, plus the CCSPS-composed message containing caller-specific information retrieved from the call center database. The call center agent then answers the call and the SIP OK and ACK exchanges proceed as in the case of a normal SIP proxied call. Note that the call center agent already has caller-specific data available before the final ACK from the CCSPS to the agent initiates voice transmission. Thus, the agent can greet the caller by name, and immediately see other important information about the caller just prior to the actual voice media arrival.

Note that the complex interactions between the PBX, CTI client, CTI server and CRM client and CRM server, typically found in advanced call centers are not required here. Rather, the action of the CCSPS composing the message body of the SIP INVITE message destined for the call agent is the mechanism for sending caller-specific data along with the call. Note that it is the CCSPS, and not a User Agent Client or Server which sends this information. The usage of the SIP INVITE method by the CCSPS for sending caller-specific information to an agent is believed to be novel.

It is important to note that, in general, the CCSPS composes different message bodies for caller and for the call center agent. For example, the message to the caller (message body 1 in Figures 6) might consist of targeted advertisements and specials, which are of interest to the caller but not to the call

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agent, while the message to agent (message body 2 in Figures 6) might consist of buying habits and bill payment history, which are of interest to the agent, but not of interest nor appropriate, for the caller.

The ability of the CCSPS to send different messages to the calling party and to the called party, eg call center agent, using standard SIP headers and messages is believed to be a novel and important aspect of this invention.

3.0 Summary:

This patent proposes various novel applications a SIP Proxy Server for call centers and e-business applications. While a SIP Proxy Server is typically used to forward and proxy various SIP messages, the use of a SIP Proxy Server to write the body of these messages is believed to be novel. We refer to this specialized form of a SIP Proxy Server as a Call Center SIP Proxy Server (CCSPS).

One aspect of the invention is that the CCSPS can compose informational messages to unauthorized callers. The caller can be informed as to why a voice connection could not be established, and could also be informed of possible next steps such as how to register for support, account status, etc. Polite and informative messages, supplied within the CCSPS-composed SIP bodies, could be an effective form of Customer Relationship Management in next-generation call centers.

Another aspect of the invention is that the CCSPS can compose sales, marketing, account status, and other informational messages for authorized callers. Thus, when a caller reaches the call center, personalized messages, composed by the CCSPS and returned to the caller within the body of SIP response messages, are delivered. This is believed to be a novel way of delivering targeted and customized information to a potential client.

Finally, another aspect of this invention is that the CCSPS composition of SIP message bodies is an effective means of delivering screen-pop information to call center agents. The CCSPS replaces portions of much more complex infrastructure, such as CTI clients and server, and CRM clients and servers, by delivering caller-specific information within the body of the SIP INVITE message proxied to the call center agent.

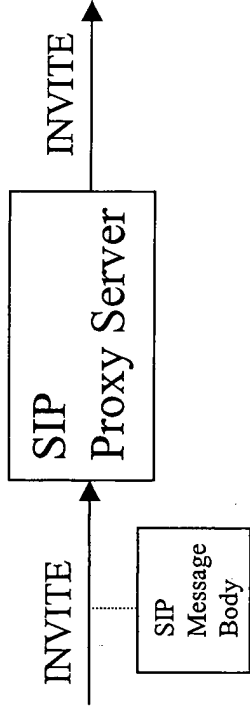


Figure 1a: SIP Proxy Server reads the SIP INVITE message body to accurately route incoming call.

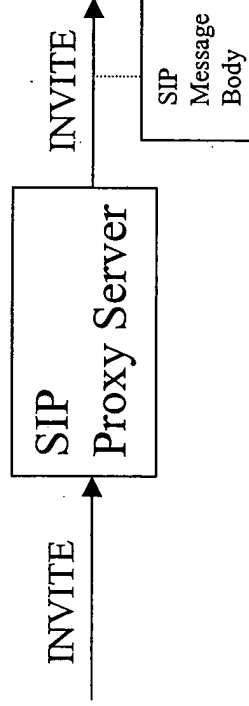


Figure 1b: SIP Proxy Server writes the SIP INVITE message body to transmit data information to caller and call center agent. A SIP Proxy Server which writes SIP messages is referred to in this patent as a Call Center SIP Proxy Server (CCSPS).

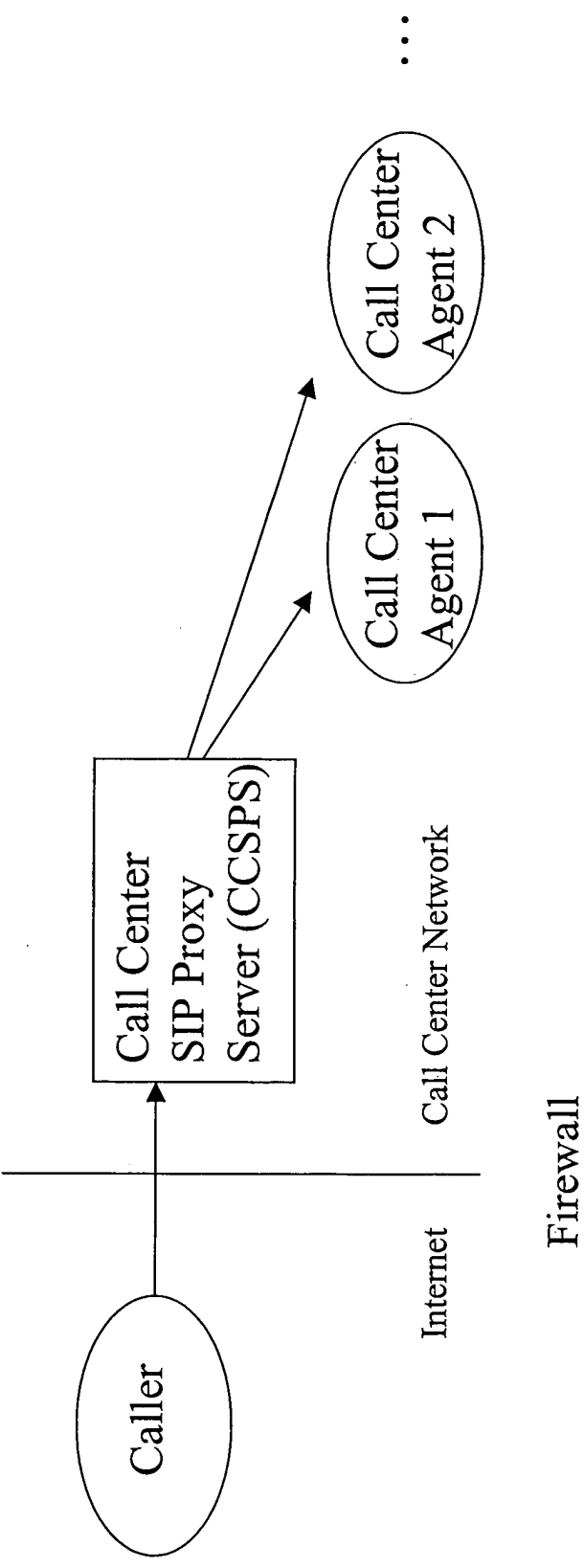
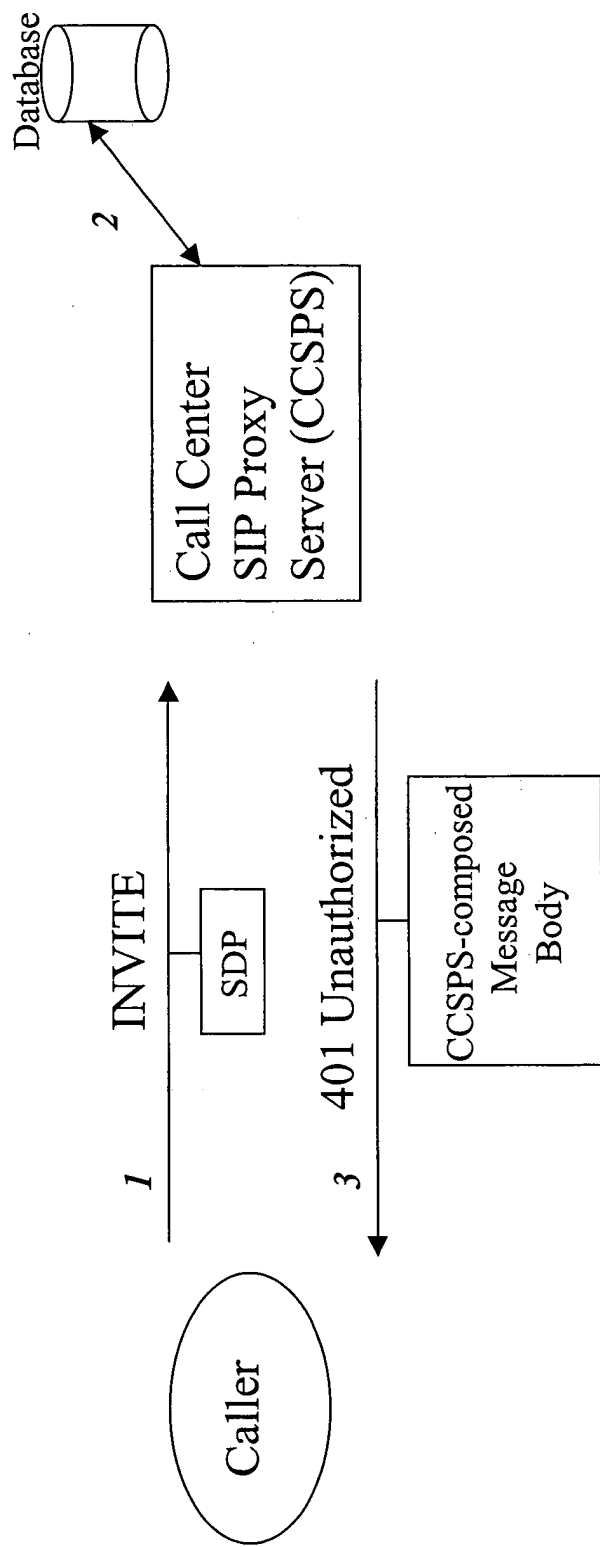


Figure 2: SIP Call Center architecture. Incoming SIP calls must be proxied and forwarded by the Call Center SIP Proxy Server (CCSPS). Call center firewall prohibits external callers from contacting call center agents directly. When the incoming SIP call arrives at the CCSPS it forwards the call to an appropriate agent. This patent describes techniques and benefits associated with CCSPS composition of SIP message bodies.



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Figure 3: Unauthorized access to the call center. Upon receiving an INVITE, the CCSPS checks its database to determine authorization. Since this caller is not authorized, the CCSPS composes an appropriate message for the caller and returns this message within the 401 Message. Thus, the caller is not only informed that he is not authorized via the message, but is further instructed as to what to do next, eg visit the web to register, enter a credit card number, etc.

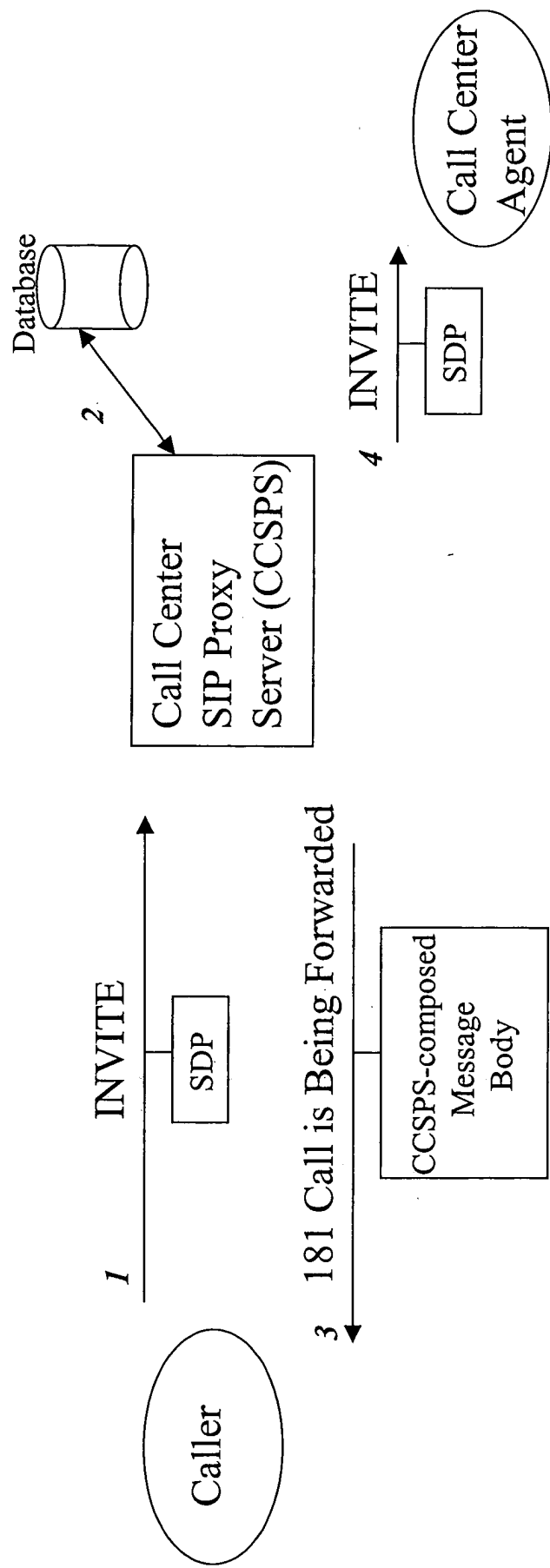


Figure 2 Authorized access to the call center. The CCSPS receives an INVITE and responds with a 181 response message. The CCSPS also composes the body for this message which could consist of targeted advertising, sales information, account information, expected wait time, etc. This information could be customized based on the caller-id.

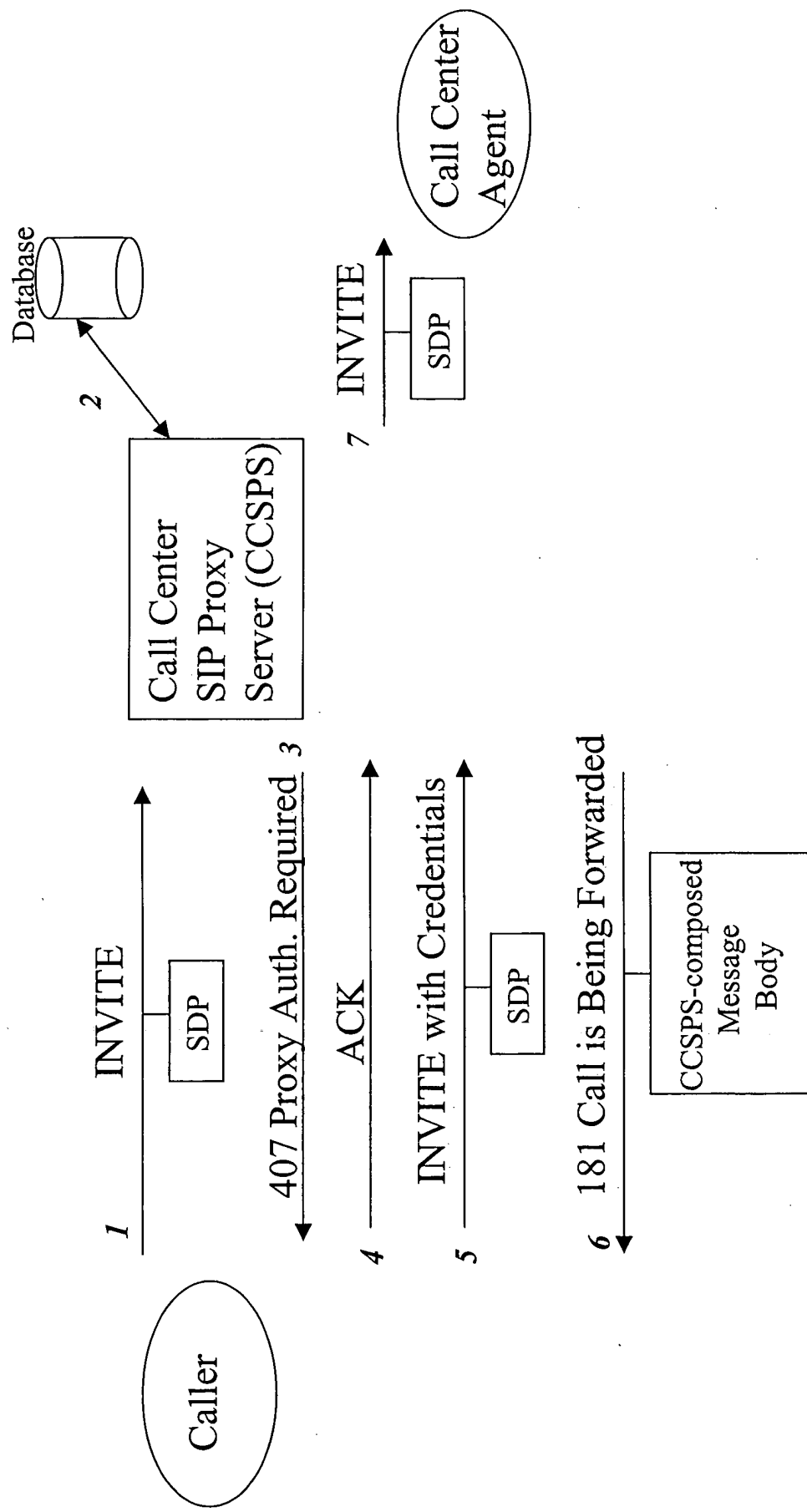


Figure 2-14 CCSPS issues challenge to caller to authenticate before call center access is allowed and before personal account data is composed and sent within the 181 Response body.

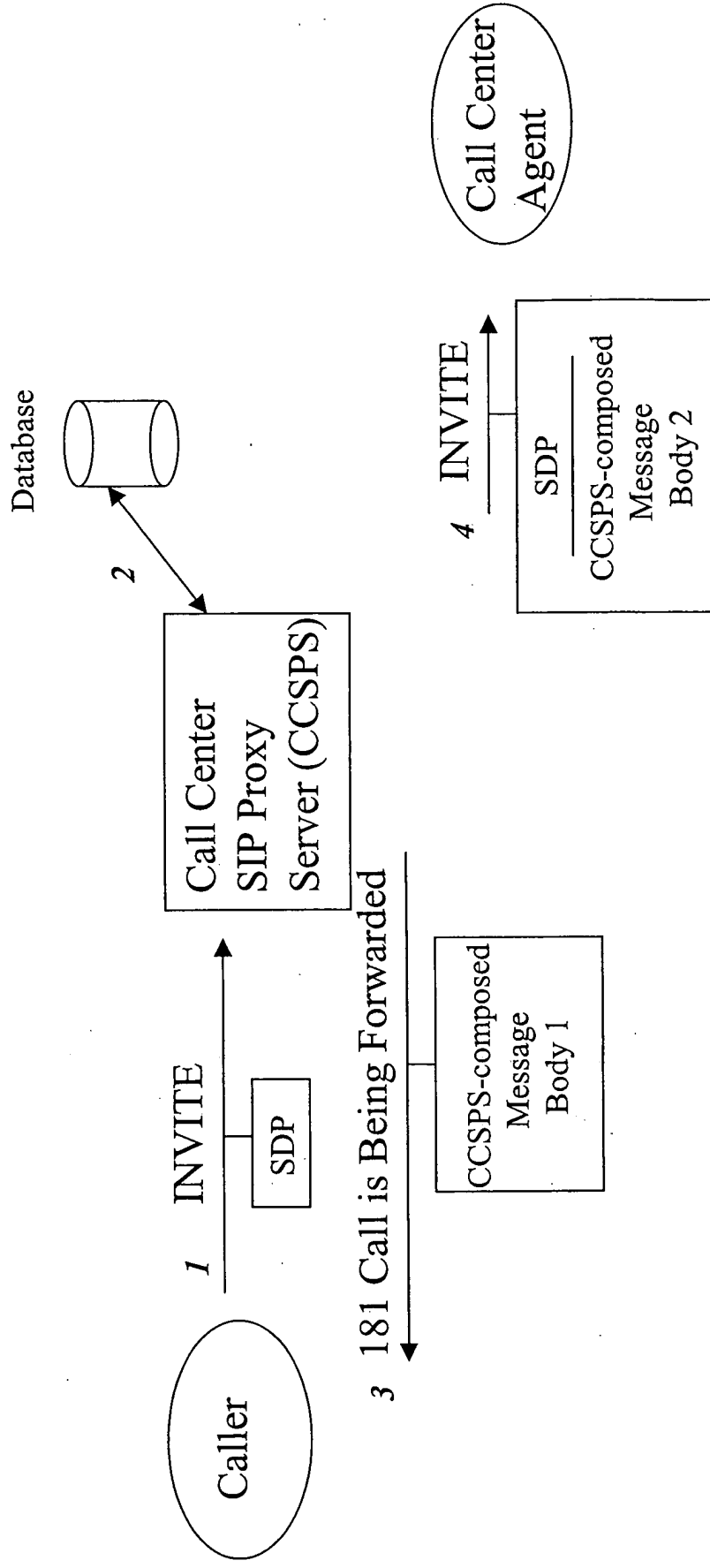


Figure 9 Method for conveying CCSPS-composed caller data to call center agent. An incoming INVITE arrives at the CCSPS. The CCSPS then accesses call center database for caller-specific information and sends an INVITE to the appropriate call center agent. The message body of the INVITE to the call center agent contains the original caller SDP message plus the caller-specific information composed by the CCSPS.